WHAT IS CLAIMED IS:

1. An apparatus for controlling the position of a screen pointer, the apparatus comprising:

an at least partially coherent light source for illuminating an imaging surface, thereby generating reflected images; and

a navigation sensor for generating digital images based on the reflected images, performing a movement computation based on the digital images, generating movement data based on the movement computation that is indicative of relative motion between the imaging surface and the apparatus, wherein the movement computation has a low sensitivity to effects in the digital images caused by particle contamination.

2. The apparatus of claim 1, wherein the light source is a laser light source.

3. The apparatus of claim 1, wherein the digital images each include a set of active pixels and a set of spare pixels, and wherein the navigation sensor is configured to detect defective pixels in the digital images.

4. The apparatus of claim 3, wherein the movement computation comprises a correlation of the set of active pixels from the digital images, and wherein defective pixels in the digital images are not included in the correlation.

5. The apparatus of claim 4, wherein the navigation sensor is configured to cause a spare pixel to become an active pixel when the navigation sensor detects a defective pixel.

6. The apparatus of claim 5, wherein the navigation sensor is configured to cause a pixel to be deactivated if the navigation sensor detects that the pixel is defective.

7. The apparatus of claim 1, wherein the navigation sensor is configured to detect defective pixels in the digital images, and identify a sub-array of pixels within the digital images that do not include any defective pixels.

8. The apparatus of claim 7, wherein the movement computation comprises a correlation of the sub-array of pixels from the digital images, and wherein pixels outside the sub-array in the digital images are not included in the correlation.

9. The apparatus of claim 1, wherein the movement computation comprises a correlation of temporal differences in a set of the digital images.

10. The apparatus of claim 9, wherein the set of the digital images includes four consecutive digital images, and wherein the movement computation comprises subtracting a first set of two of the four digital images to generate a first difference image, subtracting a second set of two of the four digital images to generate a second difference image, and correlating the first difference image with the second difference image.

11. The apparatus of claim 1, wherein the movement computation comprises summing pixels values from a first one of the digital images, thereby generating a first plurality of sums, summing pixel values from a second one of the digital images, thereby generating a second plurality of sums.

12. The apparatus of claim 11, wherein the movement computation further comprises correlating the first plurality of sums with the second plurality of sums.

13. The apparatus of claim 1, wherein the digital images each include a plurality of rows of pixels and a plurality of columns of pixels, and wherein the movement computation comprises summing pixel values in each row of the digital images, thereby generating a plurality of row sums for each digital image,

and summing pixel values in each column of the digital images, thereby generating a plurality of columns sums for each digital image.

14. The apparatus of claim 13, wherein the movement computation further comprises correlating the plurality of rows sums from a first one of the digital images with the plurality of row sums from a second one of the digital images, and correlating the plurality of column sums from the first one of the digital images with the plurality of column sums from the second one of the digital images.

15. The apparatus of claim 1, wherein the movement computation comprises correlating the digital images, thereby generating at least one correlation peak, and wherein the navigation sensor is configured to determine if the correlation produces a false correlation peak corresponding to zero displacement caused by defective pixels.

16. The apparatus of claim 15, wherein the navigation sensor is configured to determine if the correlation produces a false correlation peak by monitoring a set of pixels in the digital images and determining whether pixel values from the set of pixels are changing by a threshold amount.

17. The apparatus of claim 15, wherein the navigation sensor is configured to determine if the correlation produces a false correlation peak by determining if the correlation produces a secondary peak corresponding to a non-zero displacement with a peak magnitude that is greater than a threshold value.

18. A method of generating movement data with an optical pointing device, the method comprising:

illuminating an imaging surface with an at least partially coherent light source, thereby generating reflected images;

generating digital images based on the reflected images; and

generating movement data based on the digital images, wherein the movement data is generated based on movement calculations that have a low sensitivity to image effects caused by particle contamination.

19. The method of claim 18, wherein the light source is a laser light source.

20. A navigation sensor for generating movement data to control the position of a screen pointer, the navigation sensor comprising:

a sensor array configured to sense reflected images from an imaging surface produced by an at least partially coherent light source;

an analog to digital converter for generating digital images based on outputs of the sensor array; and

a processor for generating movement data based on the digital images, wherein the movement data is generated based on movement calculations that have a low sensitivity to image effects caused by particle contamination.